1DD 122 GP 2515

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#5

RECEIVED

JUN 16 1995

GROUP 2500

MAIL ROOM
MAY 15 1995
PAT. & TRADEMARK OFF.

In re Application of: Gene C. Koch, Bruce K. Winker, and William J. Gunning, III,	§	Serial No: 08/313,476
	§	Filed: 30 September 1994
For: SPLAY/TWIST COMPENSATOR FOR IMPROVED GRAY SCALE PERFORMANCE IN TWISTED NEMATIC LIQUID CRYSTAL DISPLAYS	§	Group Art Unit: Unknown
	§	Examiner: Unknown
	§	Atty Dkt: 94CR091

Honorable Commissioner of Patents and
Trademarks
Washington, DC 20231

CERTIFICATE OF MAILING (37 C.F.R. 1.8)

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231, on the date below.

10 MAY 95
Date

Signature

Coe F. Miles
Printed Name

PETITION FOR ACCELERATED EXAMINATION PURSUANT TO 37 C.F.R. § 1.102

Sir:

Assignee requests the above-captioned patent application be granted accelerated examination in accordance with 37 C.F.R. § 1.102(d). Pursuant to M.P.E.P. § 708.02, a preliminary search was performed by the European Patent Office (EPO); a copy of the EPO search report is attached. Copies of the cited references are also attached. An Information Disclosure Statement and associated PTO Form 1449, citing the references, are filed contemporaneously with this petition.

In accordance with 37 C.F.R. §§ 1.102(d) and 1.17(i)(2), a check in the amount of $ 130.00 is enclosed. If the check is for the incorrect amount or is missing, the Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayments, to Deposit Account No. 01-2508/TOE.

070 DF 06/05/95 08313476 1 122 130.00 CK

REVIEW OF SEARCH REPORT CITATIONS

It is noted that the European Search Report classifies all of the cited references as only being *Technological Background* (type A). The assignee agrees with this assessment. Thus, following a summary of the instant invention, abstracts from each cited reference will be given. This, it is believed, sufficiently highlights the technical distinctions between the instant invention and the cited references.

Summary of Instant Invention. The instant invention is directed to a twisted/splayed O-plate compensation device for use in liquid crystal displays. The claimed compensation device comprises an organic liquid crystal polymer thin film and possibly one or more other birefringent layers. The O-plate thin film is a birefringent medium with its optical symmetry axis, on average, oriented obliquely with the surface of the film. Within this constraint, the direction of the material's optical symmetry axis is allowed to vary continuously along the axis normal to the film surface. Such films may be fabricated by applying thin layers of chiral doped nematic or smectic liquid crystal monomer solutions in inert solvents to transparent substrates. The carrier solvents are then evaporated and the monomers polymerized by ultraviolet irradiation. Compensation devices may also be comprised of multiple layers of twisted/splayed O-plate material in conjunction with A-plates, C-plates, and simple O-plates. Fabrication techniques for twisted/splayed O-plates are described.

Iimura et al., *Super-Twisted Nematic Type Liquid Crystal Displays Device,* U.S. patent no. 5,184,237, issued 2 February 1993. The EPO search report identifies Iimura et al. as a type A (*technological background*) reference with respect to claims 1 through 3, 6 and 8. In abstract:

> A liquid crystal cell display device including a liquid crystal cell comprising a pair of substrates having transparent electrodes and aligning films, a liquid crystal composition with a positive dielectric anisotropy positioned between the substrates, major axes of the liquid crystal molecules being aligned nearly parallel in a plane parallel to the substrate when a field is applied and the liquid crystal molecules being twisted in an angle of 120° to 360° in a direction perpendicular to the substrate; a pair of polarizers positioned on opposite sides of the cell; and one or more birefringent layers positioned between the cell and at least one of the polarizers in which a maximum refractive index directions at a planes contacting the polarizer and the liquid

crystal cell, are tilted with respect to a plane parallel to the substrate, angles made between each of the directions and the parallel plane are symmetrical [sic] one another with regard to a plane parallel to the substrate when angles made between the substrate and maximum refractive index directions positioned between the contacting planes of the birefringent layers are continuously distributed.

Miyashita et al., *Liquid Crystal Display Device*, European patent document 0 576 931 A2, published 5 January 1994 for Casio Computer Company. The EPO search report identifies Miyashita et al. as a type A (*technological background*) reference with respect to claims 1, 2, 6, 8, 23 and 24. In abstract:

A polarizer (2) is arranged on the incident side of a TN type liquid crystal cell (1) in which the arrangement of liquid crystal molecules is twist-aligned through substantially 90° in a direction from one substrate (8) to the opposite substrate (11) and the value of a product $\Delta n_c \times d_c$ of a refractive index anisotropy Δn_c and a gap d_c is set within a range of 300 to 600 nm, and an analyzer (3) is arranged on the exit side of the liquid crystal cell. A twist-aligned retardation plate (4), in which the arrangement of polymer molecules is twist-aligned through 90° in a direction opposite to the twist direction of the twist orientation of the liquid crystal molecules and the value of $\Delta n_c \times d$ ranges between 100 and 600 nm, is arranged between the liquid crystal cell and the analyzer.

Mazaki et al., *Compensator for a Liquid Crystal Display*, European patent document 0 529 813 A2, published 3 March 1993 for Nippon Oil Co., LTD. The EPO search report identifies Mazaki et al. as a type A (*technological background*) reference with respect to claims 16 through 18, 23 and 24. In abstract:

According to the present invention there is provided a viewing angle compensator for a liquid crystal display capable of diminishing the viewing angle dependency of the liquid crystal display. The viewing angle compensator comprises a light transmitting substrate and a film of a specific liquid crystalline polyester, the liquid crystalline polyester taking in the liquid crystal state a structure wherein a refractive index in the

thickness direction is larger than a refractive index in at least one direction in a plane and assuming a glassy state at a temperature lower than the liquid crystal transition point of the polymer. The viewing angle dependency of the liquid crystal display can be greatly diminished and thus the viewing angle compensator of the present invention contributes to the realization of high-grade displays and higher performance of a liquid crystal display unit.

Heynderickx et al., *Liquid Crystal Display Device*, European patent document 0 423 881 A1, published 24 April 1991 for N.V. Phillips. The EPO search report identifies Mazaki et al. as a type A (*technological background*) reference with respect to claim 16. In abstract:

A liquid crystal display device having a twisted nematic liquid-crystalline material is provided with a layer of an optically anisotropic material to obtain a colourless display device which is rich in contrast. The optically anisotropic material exhibits a substantial temperature dependence and a high degree of molecular order as a result of the fact that it is formed from a synthetic resin composition comprising a polymer network having a helicoidal order. The optically anisotropic material is manufactured from a liquid-crystalline curable synthetic resin composition having a chiral dopant.

Kazo, *Liquid Crystal Display Device,* Patent Abstracts of Japan, Vol. 12, No. 413, 2 November 1988, publication date 22 June 1988, application date 15 December 1986. The EPO search report identifies Kazo as a type A (*technological background*) reference with respect to claim 1. In abstract:

PURPOSE: To setup the external appearance of a display device to a color approximate to white, to turn the color to a color approximate to black under a selected voltage impressed state and to improve the performance of display device by arranging [sic] layer of optical anisotropic body between a pair of polarizers of a liquid crystal display element. CONSTITUTION: The upper and lower polarizers 1, 6 on the display device are oppositely arranged and a high molecular liquid crystal layer 3 to be the optical anisotropic body held by the upper and lower electrode bases 2, 4 of the liquid crystal element to execute orientation processing of liquid crystal and liquid crystal 5 to be a display element are arranged between both polarizers 1, 6. The optical

anisotropic body to be the layer 3 is constituted of the mixture of a low molecular liquid crystal compound and a high molecular compound and made of high molecular nematic liquid crystal or a high molecular cholesteric liquid crystal twisted in a direction different from the twisting direction of the nematic liquid crystal in the liquid crystal 5 to be the display element. In addition, the optical anisotropic body has 70-360° twisting angle.

Emsworth, GB, *Achromatic Retardation Layers Based on Anisotropic Polymer Networks*, Research Disclosure, No. 337, 1992, pp. 411. The EPO search report identifies Emsworth as a type A (*technological background*) reference with respect to claims 16, 17 and 19. In abstract:

> Densely crosslinked oriented polymer networks can be made by the in-situ photopolymerization of liquid-crystalline (LC) diacrylates [1]. The films or coating obtained are characterized by a high birefringence Δn. . . It is known from literature [2] that when the dispersion of Δn values of the distinct stack materials is chosen differently, achromatic wave plates can be produced. It is the aim of this publication to produce achromatic wave plates by means of the photopolymerization process of LC diacrylates. the object of this process is that such a wave plate can be integrated in a variety of optical components simply as coating material or as optically functional adhesive.

Respectfully submitted,

Date: 10 MAY 95

D. C. Toedt
Reg. No. 31,144
Coe F. Miles
Reg. No. 38,559
ARNOLD, WHITE & DURKEE
P.O. Box 4433
Houston, TX 77210
(713) 787-1408

ATTORNEYS FOR ASSIGNEE